

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A cation-exchanged intercalate that is essentially free of non ion-exchanged intercalated cation and is prepared without washing away excess organic cations and by contacting a layered clay material with cations in an amount no more than an excess of 5 wt. % of the layered claim material comprising :

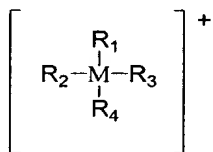
a layered clay material that has essentially all of its exchangeable cations exchanged with one or more organic cations, achieved by analyzing the layered material for cation exchange capacity, and then contacting the layered material with said organic cations, or salts thereof, in an amount no more than 5% more than the amount required for complete ion-exchange, as determined by said analysis, such that the cation exchanged layered material [[and]]contains extractable salts of organic cations in an amount no more than 5 weight % of the layered clay material after ion-exchange.

2. (Currently amended) The intercalate of claim 1, wherein the cation-exchanged organic cations comprise at least [[99.5%]] 95 molar percent of the cation exchange capacity of the layered clay material.

3. (Currently amended) The intercalate of claim 1, wherein the extractable salts of the organic cations comprise no more than [[0.5]] 5 molar percent of the cation exchange capacity of the layered clay material.

4. (original) The intercalate of claim 1, wherein the organic cation is an onium salt.

5. (original) The intercalate of claim 1, wherein the organic cation has the formula



wherein M is either nitrogen or phosphorous, and R1, R2, R3, and R4 are independently organic and/or oligomeric ligands or may be hydrogen.

6. (original) The intercalate of claim 5, wherein the organic cation is an ammonium salt.
7. (Previously presented) The intercalate of claim 1, wherein the cation-exchanged layered clay material is intercalated with an intercalant oligomer or polymer selected from the group consisting of a polyester, polyetherester, polyamide, polyesteramide, polyurethane, polyimide, polyetherimide, polyurea, polyamideimide, polyphenyleneoxide, phenoxy resin, epoxy resin, polyolefin, polyacrylate, polystyrene, polyethylene-co-vinyl alcohol, a copolymer thereof, and a mixture thereof.
8. (original) The intercalate of claim 7, wherein polymer intercalant comprises a partially aromatic polyamide, aliphatic polyamide, wholly aromatic polyamide or a mixture thereof.
9. (original) The intercalate of claim 7, wherein the polymer intercalant comprises poly(m-xylylene adipamide) or a copolymer thereof, isophthalic acid-modified poly(m-xylylene adipamide), nylon-6, nylon-6,6, or a copolymer thereof, EVOH or a mixture thereof.
10. (original) The intercalate of claim 1, wherein the layered clay material comprises montmorillonite, hectorite, mica, vermiculite, bentonite, nontronite, beidellite, volkonskoite, saponite, magadite, kenyaite, or a mixture thereof.
11. (original) The intercalate of claim 1, wherein the layered clay material comprises sodium montmorillonite or sodium bentonite.
12. (Previously presented) An exfoliate made by delaminating the intercalate of claim 1 such that at least 50 percent of the layered clay material is dispersed in the form of individual platelet particles and tactoids in a carrier and the individual platelet particles have a thickness of less than about 2 nm and a diameter of from about 10 to about 3000 nm.

13. (Currently amended) A process for preparing a cation-exchanged intercalate having a decreased level of extractable cations without washing excess cations from the intercalate after ion-exchange comprising the step of:

contacting a layered clay material with an organic cation after analysis of the clay material to determine an amount of said organic cation within the range of 0.95 and 1.05 moles of organic cation for each mole of exchangeable cations in the layered clay material.

14. (original) The process of claim 13, further including the step of intercalating the cation-exchanged layered clay material with an oligomer or polymer intercalant.

15. (original) The process of claim 14, wherein the oligomer or polymer intercalant is intercalated into the layered clay material in a batch mixing or a melt compounding extrusion process.

16. (cancelled)

17. (Previously presented) The process of claim 14 further including the step of shearing the intercalate in a suitable carrier to delaminate the intercalate such that at least 50 percent of the layered clay material is dispersed in the form of individual platelet particles and tactoids and the individual platelet particles have a thickness of less than 2 nm and a diameter of from about 10 to about 3000 nm.

18. (Previously presented) The process of claim 13 wherein the moles of exchangeable cations in the layered clay is determined empirically in order to approximate an equimolar quantity of organic cation to intercalate into the clay by titrating the clay with an organic cationic indicator that cation-exchanges with the exchangeable cations in the clay and provides an indication when all exchangeable cations have been ion-exchanged with cations from the indicator.

19. (original) The process of claim 18, further including the step of extracting any excess cations from the organic cation-contacted layered material to determine by trial and error if an amount of organic cations intercalated into the layered clay material should be raised or lowered from the approximate cation amount determined by titration.

20. (Previously presented) The process of claim 19, further including the steps of incrementally raising or lowering the amount of organic cations intercalated into the layered clay material and analyzing the layered clay material for excess cations until the amount of cations added to the layered clay material for intercalation is in the range of 0.95 to 1.05 moles of organic cation for each mole of exchangeable cations in the layered clay material.

21. (Currently amended) A process for preparing a cation-exchanged intercalate having a decreased level of extractable cations comprising the step of:

analyzing the organic cation intercalated clay for extractable organic cations [[%]] to determine an amount of organic cations sufficient to provide 0.95 to 1.05 moles of organic cations for each mole of exchangeable cations in the layered clay material; and contacting the layered clay material with said organic cations.

22. (Previously presented) The product made by the process of claim 13.

23. (Previously presented) The product made by the process of claim 14.

24. (Previously presented) The product made by the process of claim 15.

25. (Previously presented) The product made by the process of claim 16.

26. (Previously presented) The product made by the process of claim 17.

27. (Previously presented) The product made by the process of claim 18.

28. (Previously presented) The product made by the process of claim 19.

29. (Previously presented) The product made by the process of claim 20.

30. (Previously presented) The product made by the process of claim 21.